

ASSIGNMENT - 4

Date	11 November 2022
Team ID	PNT2022TMID32816
Project Name	SMARTFARMER - IoT enabled smart farming applications
Student name	NANDHINI.M

QUESTION:

Write code and connections in wokwi for ultrasonic sensor. Whenever distance is less than 100 CMS send "alert" to IBM cloud and display in device recent events.

CODE :

```
#include <WiFi.h>                // library for WIFI

#include <PubSubClient.h>        // library for MQTT

//----- credentials of IBM Accounts -----

#define ORG "rwazv5"            // IBM organisation id
#define DEVICE_TYPE "NodeRed" // Device type mentioned in ibm watson iot platform
#define DEVICE_ID "12345"      // Device ID mentioned in ibm watson iot platform
#define TOKEN "vC@S3TBre6(97jAOJ_" // Token
#define speed 0.034
#define led 14 String data3;
int LED = 4;

//----- customise above values -----

char server[] = ORG ".messaging.internetofthings.ibmcloud.com"; // server name
char publishTopic[] = "iot-2/evt/sreedhar/fmt/json";           // topic name and type of event perform and
format in which data to be send
char topic[] = "iot-2/cmd/led/fmt/String";                     // cmd Represent type and command is test format of
strings
char authMethod[] = "use-token-auth";                          // authentication method
char token[] = TOKEN;
char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID; //Client id

//-----

WiFiClient wifiClient;      // creating instance for wificlient
```

```
PubSubClient client(server, 1883, wifiClient); // calling the predefined client id by passing parameter like server id,port and wifi credential
```

```
const int trigpin=5; const  
int echopin=18;  
String command;  
String data="";
```

```
long duration; float  
dist;
```

```
void setup()  
{  
  Serial.begin(115200);  
  pinMode(led, OUTPUT);  
  pinMode(trigpin, OUTPUT);  
  pinMode(echopin, INPUT);  
  wifiConnect(); mqttConnect();  
}
```

```
void loop() { bool isNearby  
= dist < 100;  
digitalWrite(led, isNearby);
```

```
publishData();  
delay(500);
```

```
if (!client.loop())  
{  
  mqttConnect(); // function call to connect to ibm  
}  
}
```

```
/* -----retrieving to cloud----- */
```

```
void wifiConnect()  
{  
  Serial.print("Connecting to ");  
  Serial.print("Wifi");  
  WiFi.begin("Wokwi-GUEST", "", 6); while  
(WiFi.status() != WL_CONNECTED)  
  {  
    delay(500);  
    Serial.print(".");  
  }  
  Serial.print("WiFi connected, IP address: ");
```

```

    Serial.println(WiFi.localIP());
}
void mqttConnect()
{
    if (!client.connected())
    {
        Serial.print("Reconnecting MQTT client to ");
        Serial.println(server); while
        (!client.connect(clientId, authMethod, token))
        {
            Serial.print(".");
            delay(500);
        }
        initManagedDevice();
        Serial.println();
    }
}

void initManagedDevice() {
    if (client.subscribe(topic))
    {
        Serial.println("IBM subscribe to cmd OK");
    }
    else
    {
        Serial.println("subscribe to cmd FAILED");
    }
}

void publishData()
{
    digitalWrite(trigpin,LOW);
    digitalWrite(trigpin,HIGH);
    delayMicroseconds(10); digitalWrite(trigpin,LOW);
    duration=pulseIn(echopin,HIGH); dist=duration*speed/2;
    if(dist<100)
    {
        digitalWrite(LED,HIGH); String
        payload = "{\"Alert Distance\":\""; payload
        += dist;
        payload += "\"}";

        Serial.print("\n");
        Serial.print("Sending payload: "); Serial.println(payload); if (client.publish(publishTopic, (char*)
        payload.c_str())) // if data is uploaded to cloud successfully,prints publish ok else prints publish failed {
        Serial.println("Publish OK");
    }
}

```

```

}
}
if(dist>100)
{
    digitalWrite(LED,HIGH); String
    payload = "{\"Distance\":\"";
    payload += dist;
    payload += "\"}";

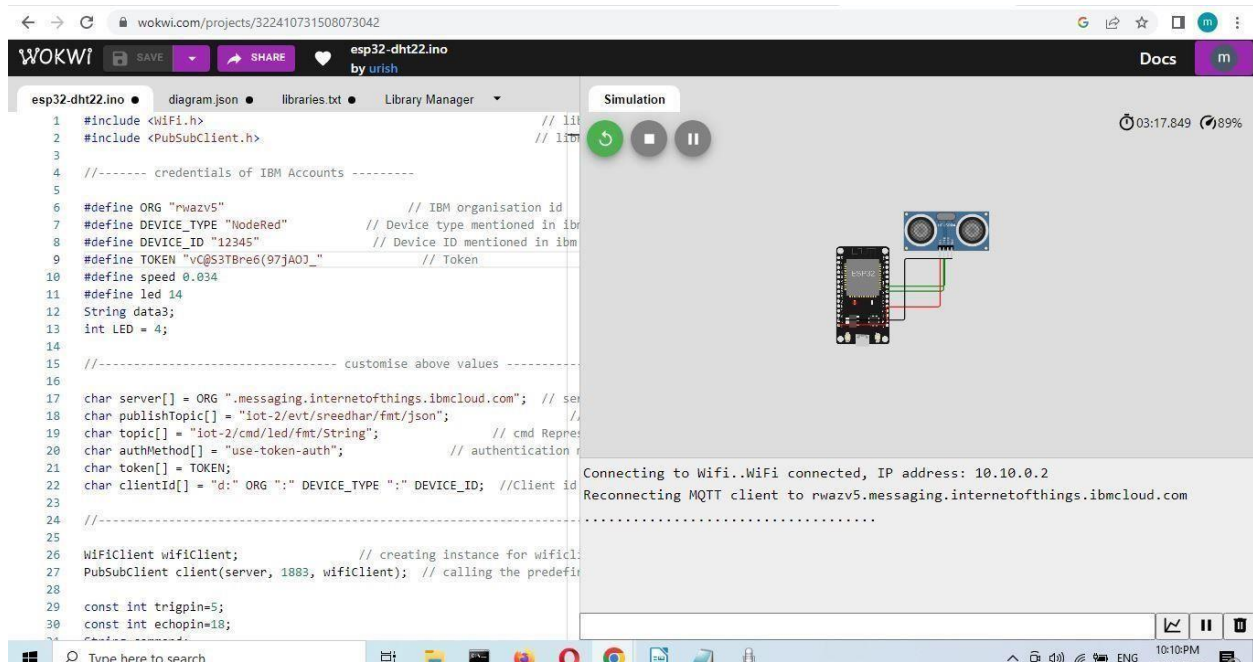
    Serial.print("\n");
    Serial.print("Sending payload: "); Serial.println(payload);
    if(client.publish(publishTopic, (char*) payload.c_str()))
    {
        Serial.println("Publish OK");
    }
    else
    {
        digitalWrite(LED,LOW);
        Serial.println("Publish FAILED");
    }

}
}

```

OUTPUT :

Code simulation on wokwi



Data sent to IBM Cloud with distance

